REMARKS

In the Advisory Action, the Examiner maintained the rejection of claims 1 through 15. Applicant submits the following.

Claim Rejections, 35 U.S.C. §112

In item 2 on page 2 of the Office Action, the Examiner rejected claims 1-15 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. This rejection is traversed.

In the Office Action, the Examiner asserts that the claims contain subject matter that was not described in the specification. More specifically, the Examiner asserts that the limitation "single-phase" training signal is not referenced or supported in the specification.

Applicant acknowledges that the precise phrase "single-phase training signal" is not used in the specification. However, reference to the specification makes it clear that the training signal S_T is indeed a single phase training signal; if it were otherwise, a calculation would be shown whereby the phase offset is calculated and included as part of the training signal. Instead, the equations referenced in the present invention show the use of a "pure" training signal, that is, a training signal sent from the subscriber to the service provider without a phase adjustment added thereto. For it to be a multi-phase training signal being transmitted, the phase offset would have to be calculated before transmission, and then included in the transmission. As described in the specification, the phase offsets are calculated

after receipt by modulator 16 (see pages 6-8 of the specification) based upon the already-transmitted-and-received training signal S_T:

"The operation of the service provider 10 can be further explained with reference to the following mathematical analysis. In particular, if we assume that the subscriber 20 transmits a training signal, S(t), with all harmonic terms as follows:

$$S(t) = \sum_{i=1}^{\infty} \sin(i * \omega_0 t) \qquad (1)$$

where ω_0 is the base frequency.

Then the received signal, R(t), at the service provider 10 will be:

$$R(t) = \sum_{i=1}^{\infty} C_i \sin[i * \omega_0 (t - t_0 - \Delta t)] + n(t) \qquad (2)$$

where Δt is a phase offset between the receiving service provider 10 and the transmitting subscriber 20 due to the sampling offset, and
where t_0 is the time delay at the receiving service provider 10 and C_i is constant coefficient.

The modulator 16 can then calculate the signals Rx and Ry. In particular, modulator 16 modulates R(t) by a cosine signal to generate Rx and modulator 16 modulates R(t) by a sine signal to generate Ry. That is:

$$Rx = \int_T R(t) * \cos(\omega_0 t) dt = \sum_{i=1}^{\infty} \int_T C_i \sin[i * \omega_0 (t - t_0 - \Delta t)] \cos(\omega_0 t) dt + N(t) = C_1 \sin[\omega_0 (t_0 + \Delta t)] + N$$

$$Ry = \int_T R(t) * \sin(\omega_0 t) dt = \sum_{i=1}^{\infty} \int_T C_i \sin[i * \omega_0 (t - t_0 - \Delta t)] \sin(\omega_0 t) dt + N(t) = C_1 \cos[\omega_0 (t_0 + \Delta t)] + N$$

where $T = \frac{2\pi}{\omega_0}$

The processor 18 can determine the phase offset by calculating the arctangent of (Rx/Ry). In particular, analysis of the above cited equations for Rx and Ry reveals that:

$$(t_0 + \Delta t) = \frac{1}{\omega_0} \arctan \frac{Rx}{Ry} + n$$

or

$\Delta t = (1/\omega_0) * \text{arctangent } (Rx/Ry) + n - t_0$,"

As noted in a prior response, this is in direct contrast to both of the Pilozzi references, which teach the transmission of a two-phase training signal comprising the original signal plus a phase offset signal. In other words, the training signal of Pilozzi comprises the two signals (original and phase offset) and thus it is an adjusted training signal that is transmitted. The present invention transmits an unadjusted training signal and then adjustments to that signal are calculated after receipt, while the Pilozzi references transmit a dual phase (original plus phase offset) signal, i.e., the adjustments are made before receipt.

The specification clearly supports applicant's claiming of a single-phase training signal being sent from the subscriber to the service provider. While considered unnecessary, the applicant amended the specification to include specific reference to the phrase "single-phase." The Examiner is of the opinion that such an amendment is not supported by the specification. Applicant disagrees with the Examiner; however, to further prosecution and move the subject application to allowance, applicant has amended the claims to remove reference to "single-phase" and to instead recite the transmission and receipt of an "unadjusted" training signal. This is clearly supported by the specification, which specifies that a training signal is sent to and is received by a service provider, and then the phase offset (the adjustment) is made to the received signal, i.e., it is transmitted unadjusted and then adjusted after receipt (*See*, for example, Summary of the Invention.).

The Examiner Has Not Established a *prima facie* Case of Anticipation

As noted above, the present claimed invention includes an unadjusted training signal used to correct for the phase offset between a subscriber line and a service provider. This unadjusted training signal is now explicitly claimed in each of the claims. Neither "Pilozzi '173" nor "Pilozzi '651" teach the use of an unadjusted training signal. Each make an adjustment to the training signal by adding in the phase offset signal as part of the training signal. Accordingly, each of the independent claims, and all claims depending therefrom, patentably define over Pilozzi '173 and are in condition for allowance.

The Examiner has not Established a *prima facie* Case of Obviousness

As set forth in the MPEP:

> To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skilled in the art, to modify the reference or to combine reference teachings.
> MPEP 2143

As noted above, the present invention as claimed requires an unadjusted training signal to be utilized in connection with the phase offset correction. Also, as noted above, neither "Pilozzi '651" nor "Pilozzi '173" teach or suggest the use of an unadjusted training signal; instead, each of these references teach only the use of a dual-phase, adjusted probing signal in connection with phase adjustments. Without such a teaching or suggestion, a rejection of the claims based on "Pilozzi '173" or "Pilozzi '651", either alone or in combination, is not

appropriate. Accordingly, Claims 2, 5, 7, 8 and 13 patentably define over "Pilozzi '173" and "Pilozzi '651", both alone or in combination, and are in condition for allowance.

Conclusion

The present invention is not taught or suggested by the prior art. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection of the claims. An early Notice of Allowance is earnestly solicited.

Enclosed herewith, in duplicate, is a Petition for extension of time to respond to the Examiner's Action. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment associated with this communication to Deposit Account No. 19-5425.

Respectfully submitted

January 18, 2005
Date

Mark D. Simpson, Esquire
Registration No. 32,942

SYNNESTVEDT & LECHNER LLP
2600 ARAMARK Tower
1101 Market Street
Philadelphia, PA 19107

Telephone: (215) 923-4466
Facsimile: (215) 923-2189

M:\MSimpson\Clients\Agere Systems, Inc\27118 USA\Patent Office\Reply for RCE.doc